

MIDLAND

MODEL 23-110 VTVM

Quality **WORLD-WIDE** Products

**SPECIFICATIONS AND OPERATING
INSTRUCTIONS FOR MIDLAND
MODEL 23—110**

SPECIFICATIONS:

Ranges :

DC VOLTS.

Ranges : 0—6/30/120/300/1200 Volts.

Input resistance : 11 Megohms (all ranges).

AC VOLTS.

Ranges : 0—6/60/300/1200 Volts. (RMS)
0—17/170/850/3.4 K Volts. (P—P)

Frequency response : from 30 c/s to 3 mc/s, $\pm 10\%$
(6—300 V ranges for F. S. D.,
Source impedance 100 ohms,
approx.)

OHMS.

0—1000 megohms.
(10/1 K/1 Megohms on centre scale)

Meter movement :

Moving coil type, 100 μ A., F. S. D.

Tube compliment :

12 AX 7 $\times$ 1

Accessories :

AC—DC Measuring Probe.

Test Lead.

Power Supply :

117 V, 50 c/s—60 c/s, AC.

Internal 1.5 V Dry Battery.

FRONT PANEL CONTROLS

Main Switch :

Power is applied to the instrument when this control is turned to the "ON" position.

Note :

when using the 23—110 V. T. V. M., wait approximately 30 secs., to 1 minute after turning the instrument on, to allow it to warm up.

Range Switch :

Selects the AC, DC or resistance required.

Note :

If an AC or DC voltage is unknown, select the highest range first and work down to a lower range, as a precautionary measure.

Electrical Zero Adjustor :

This is used to set the instrument pointer to the zero mark on the instrument scale.

Ohms Adjustor with Meter Clamp Switch :

This is used to set the instrument pointer to the f. s. d. (∞ ohm) mark on the resistance scale (when the instrument is used on the ohms ranges).

Meter Mechanical Zero Corrector :

This control is a screwdriver adjustment, and is centrally located between the "zero adjustor" and "ohms adjustor"

controls on the front panel. It should be set so that the instrument pointer rests in the zero position of the scale when the instrument is not in use.

Polar Reversing Switch :

This is used to change the polarity of the V. T. V. M. when DC voltage ranges.

Preliminary adjustments :

- (1) Connect the AC—DC Probe and the Test Lead to the connectors on the front panel.
- (2) If necessary, set the meter to Mechanical Zero by the "Meter Mechanical Zero Corrector".
- (3) Connect the power cord to the AC Outlet
- (4) Set the "Function Switch" to "DC" ranges.
- (5) Set the "Ohms Adjustor" to "CLAMP" position.
- (6) Set the "Polar Reversing Switch" to "+" position.
- (7) Set the Main Switch to "ON" position and allow a short warm—up period (1 minute).
- (8) Turn the OHMS Adjustor knob clockwise from "CLAMP" position.
- (9) Adjust the "Zero Adjustor Control" to position the meter pointer to zero.
- (10) When measuring voltages, connect the alligator clip of the test lead to ground (chassis) of the unit under test.
- (11) Set the "Power and Function Switch" to "OFF" position when 23—110 is not in use.

SCALES :

AC and DC voltages are read on the black DC and AC scale, but when the 6 Volt AC range is in use, the AC

6 Volt scale should be used.

The black ohms. scale is used for resistance readings.

P—P and db., scales are used for P—P and decibel measurements of AC voltages.

AC Voltage :

- (1) Set the switch on the AC—DC Probe to the AC Ω position.
- (2) Set the range switch to AC position in excess of the estimated voltage to be measured.
- (3) Adjust the "Electrical Zero Control" to bring the meter pointer to the zero position.

Resistance :

- (1) Set the switch on the AC—DC Probe to AC— Ω position.
- (2) Set the "Function Switch" to Ohms.
- (3) Set the range switch to the resistance range required.
- (4) Short the probe head and alligator clip and adjust the "Electrical Zero Control" to position the pointer to zero.
- (5) Remove the short, and set the "Ohms Adjust Control" for full scale meter deflection.
- (6) Connect the probe head and alligator clip to the resistance to be measured.
- (7) Multiply the reading obtained on the OHMS scale by the factor indicated on the range switch.

DC VOLTAGE (Normal Condition)

- (1) Set the switch on the probe to the "DC" position.
- (2) Set the "Polar Reversing Switch" to "+" or "-", as required.
- (3) Connect the clip on the Negative test lead to ground

(chassis) on the unit under test.

- (4) Set the "Range Switch" to a position in excess of the anticipated voltage to be measured.
- (5) Adjust the "Electrical Zero Adjustor Control" to set the meter pointer to zero.

(CENTER ZERO MEASUREMENT)

NOTE: The maximum input must never exceed HALF that indicated on the range scale.

There are four ranges each equal to + or - half the voltage indicated on the Range Switch scale, e. g. 30 V scale : centre zero reading + or - 15 v.

- (6) Rotate the "Electrical Zero Control" to set the pointer to the centre zero mark, located near the bottom of the scale.
- (7) Set the Range Switch to a position equal to at least TWICE the voltage anticipated.

